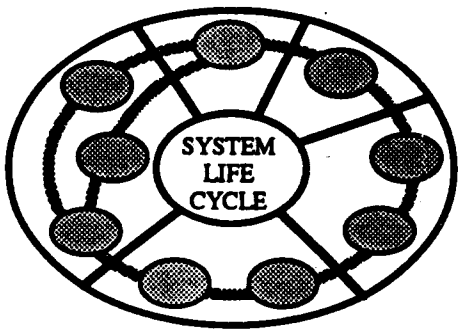
# OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE (OSWER)




# SYSTEM LIFE CYCLE MANAGEMENT GUIDANCE

## Part 3: Practice Paper

## *Project Management Plan*

## January, 1989

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## EXHIBITS



Appendices

## 1. PRACTICE PAPER PURPOSE

This practice paper constitutes a section of Part 3 of the Office of Solid Waste and Emergency Response (OSWER) System Life Cycle Management Guidance. It describes the Project Management Plan, a key document of the system life cycle. Every system project is required to develop and use a Project Management Plan. This practice paper describes the structure and content of the Project Management Plan, and its evolution through the system life cycle.

OSWER places great emphasis on the Project Management Plan because of the intrinsic difficulty of managing system projects, especially projects for systems that support more than a handful of individuals. Rigorous development and use of the Project Management Plan will help ensure that important issues regarding the approach to the project are carefully considered and the decisions are documented. The Project Management Plan also helps to communicate the approach and coordinate the approach across all project team members, and to clearly measure progress in completing the project.

The topics addressed in this practice paper include:

- The structure and content of a complete Project Management Plan;
- Responsibility for preparing and updating the Project Management Plan;
- How the Project Management Plan evolves through the system life cycle; and
- How the components of the Project Management Plan relate to each other and to the other products of the system life cycle.

The Project Management Plan serves several important purposes in support of the system life cycle:

- Helps ensure that important issues are purposefully considered and that key decisions are clearly documented;
- Helps support the coordination of various organizations and individuals involved in a system project, by providing a single known source of information regarding the project approach and the role of each organization/individual; and
- Provides a basis for measuring progress through the system life cycle, and the potential impact of any changes to the approach for conducting the project.

This practice paper is not intended as a primary means for training project managers. Rather, it describes an approach for clearly documenting certain project management topics and decisions of importance to OSWER. It should also be noted that although the Project Management Plan references certain characteristics of an information system (e.g., software tools, security), the Project Management Plan describes the logistics for the project. It does not serve as documentation of the system requirements, design or other features of the system included in other formal system documentation.

## 2. STRUCTURE AND CONTENTS OF PROJECT MANAGEMENT PLAN

The Project Management Plan should use the same basic structure for all systems projects. This structure is presented in Exhibit 2-1. All topics shown in Exhibit 2-1 should be included in the plan; however, the level of detail at which each is discussed should be tailored to the individual project.

No specific format is required for most topics; however, certain specific information should be provided. This section of the practice paper identifies the information to be provided for each topic of the Project Management Plan, and suggests specific formats or presentation techniques where appropriate. Appendix A provides a more detailed outline of the complete Project Management Plan.

### 2.1. Project Charter/Objectives

Every system project should have a clear charter, describing the objectives of the project and certain other key project attributes. This section of the Project Management Plan provides the overall context for the other sections of the Plan. It summarizes the following information from the Project Initiation Decision Paper:

- The information management problem to be solved,
- The scope of the problem in terms of OSWER programs and organizations,
- The timeframe for solving the problem, and
- The organization(s) and individual(s) that serve as programmatic sponsor for the project.

### 2.2. Life Cycle Adjustment

Parts 1 and 2 of this Guidance describe a specific sequence of life cycle phases and stages, a sequence that applies to the entire system. For some projects, it may be desirable to adjust

## EXHIBIT 2-1: OUTLINE OF PROJECT MANAGEMENT PLAN

*TOPICS*

Project Charter/Objectives
Life Cycle Adjustment
Project Team Organization
Project Budget
Project Reviews/Quality Assurance
Applicable Project Approvals
Benefit-Cost Analysis
Methodologies and Tools
Workplan
Procurement Approach
Configuration Management Plan
Documentation Standards
Security Approach
Conversion Approach
Installation Approach
User Support Approach
Maintenance Approach
Operations Approach

the life cycle, such as by combining certain stages, or by dividing the system into different modules, each with its own schedule for progressing through the life cycle. This section of the Project Management Plan is extremely important, because it establishes the framework for many other sections, particularly the project Workplan. This section describes any significant planned adjustments to the conventional system life cycle described in Parts 1 and 2 of this Guidance, and the reasons for such adjustments. Examples of the types of adjustments that should be included in this section are:

- The consolidation of portions of two or more stages, such as the generation of software (part of the Development stage) during the Design stage,
- Partitioning the project or system into modules or work packages (usually done during the Concept phase), with different life cycle schedules for one or more modules,
- Phased development of the system or data base using multiple life cycles -- one to provide basic system capabilities, and subsequent cycles to provide expanded capabilities through the planned replacement of major portions of the system,
- Iterative cycling through portions of the life cycle, as is often the case in the development of an expert system,
- Consolidation of two or more system life cycle products, including consolidation of System Decision Papers, and
- Elimination of <u>any</u> system life cycle products.

## 2.3. Project Team Organization

This section describes how the project team will be organized in terms of the specific organizations and individuals who will participate actively in the project. This section is particularly useful for large projects, with many participating organizations and individuals. The Project Manager may use this section of the Plan as a stand-alone document, distributing it to all participating organizations (including contractors) and individuals to improve project coordination.

Specific information contained in this section should be documented using an organization chart, as well as other applicable techniques, and includes:

- Identification of the Project Manager, his/her current home organization, and any assignment of this individual to another organization (e.g., detailing to another office) to accomplish his/her role as project manager;

- Identification of any supporting organization structures that will serve in a project management role, such as boards and advisory committees, and the roles and authorities of such organizations. These organizations may be unique to the system, or may be standing organizations with management responsibilities for systems affecting a designated program;

- Description of project staffing, including Agency personnel and contractor support. The home organization and percentage and duration of assignment and for each Agency team member should be clearly identified. Specific contractor organizations should be identified as soon as is practical. Total contractor staff assigned to the project, and key contractor personnel should be identified as well. The roles of each member of the project team should be clearly identified on a person-by-person basis or, for very large projects, by identifying the specific sub-team to which each member is assigned. Experts in programmatic or technical subject matter of particular importance to the project should be clearly identified.

- Description of the structure of the project staff reporting to the project manager, including the identification of any sub-teams (if applicable) and size and team leaders for each team;

- Identification of the data steward for the project, or multiple stewards if appropriate, for different types of data;

- Identification of individual organizations that have an interest in the system and are not directly represented on the project team, but which will be informed of major milestones and decisions through the distribution of required system decision papers and other materials as appropriate. Examples include:

  -- Individual regional waste management program organizations,

  -- Office of Information Resources Management,

  -- National Data Processing Division - NCC and WIC,

  -- Individual regional ADP organizations,

  -- Individual State waste management program organizations, and

  -- Office of the Inspector General;

- Identification of the members of the Change Control Board, and the authority of the Board (i.e., a decision-making body or an advisory body to the Project Manager).

OSWER requires the use of block diagrams, or similar techniques, to illustrate the project team organization. Multiple diagrams should be used to illustrate team structures that are expected to change throughout the life cycle.

A separate System Life Cycle Management Guidance Practice Paper entitled 'Project Participation and Coordination' provides suggestions for identifying the organizations who should participate in each system project. Of vital importance, the contents of the Project Management Plan should be coordinated with all the organizations that will be involved in the project. The level of commitment of Agency staff to the project, and their commitments to other assignments, must be agreed on by the Project Manager and each participant's supervisor.

## 2.4. Project Budget

This section identifies the approved resources to be used to accomplish the project, the source of funding for all resources in terms of organizational entities (e.g., allowance holders and suballowances), and the accounting methods and procedures that will be used to monitor the project budget. The Project Budget section of the Project Management Plan is particularly important because it describes a commitment of resources, and not just a need for resources. The project budget is broken out for each phase and stage, and identifies the resource level and cost of the following types of resources, as applicable:

- EPA staff,
- Contractor services,
- Equipment purchase or lease,
- Equipment maintenance,
- Site preparation (e.g., to accommodate ADP equipment),
- Software package(s) purchase or lease,
- Supplies,
- Computer timeshare (internal to EPA such as use of the National Computer Center mainframe, and external services)
- Other costs

For some projects, the Project Budget may also serve to indicate the need for additional resources -- the difference between the resources needed for each phase and/or stage and the commitments received to date.

OSWER places particular emphasis on effective monitoring and control of project resources and budgets. For each of the above resources, this section of the Project Management Plan identifies the procedures and tools to be used to track the expenditure of project resources against the budget provided by each funding source.

Of particular note, the Project Budget (together with the Benefit-Cost Analysis) serves as the source of cost information used to determine the appropriate level of review and approval for the project (i.e., Threshold Analysis).

## 2.5. Project Reviews/Quality Assurance

This section identifies the individual formal project reviews and other quality assurance activities to be conducted during the system life cycle. Project reviews are a key step in each phase and stage of the life cycle -- they provide feedback to the project team, and are advisory to the project approval authority who will be asked to approve the continuation of the project. (The required reviews, and technique for determining who should conduct them (i.e., Threshold Analysis), are described in the practice paper on 'System Life Cycle Reviews and Approvals'.)

Some of the information contained in this section of the Project Management Plan will be developed by the Lead Reviewer for the project, and should be provided to the Project Manager. Specific information contained in this section includes:

- Identification of the applicable 'threshold', or organizational level for conducting required reviews. For a Level I system, also designates the criteria that result in the Level I classification;

- Identification of the specific formal project reviews to be conducted in each phase and stage, and approximate schedule. The number of reviews and schedule should be structured to reflect any adjustments to the system life cycle.

- Identification of the specific organizations and individuals who will participate in each review; designated individuals should be independent of the project team;

- Description of how the reviews are to be conducted, and the approach/procedure to be used to document the results of reviews; and

- Drawing from the project Workplan, identification of other activities to be conducted to confirm the programmatic and technical findings and recommendations of the project team (e.g., system design walkthroughs and presentations, circulation of life cycle products to user and other organizations for comment, independent validation and verification (IV&V), acceptance testing). To ensure that the project team will effectively solve the information management problem, these other activities are strongly encouraged. Reviews should not be limited to only the formal reviews and specified for each phase of the life cycle.

## 2.6. Applicable Project Approvals

This section identifies the individual formal project approvals to be obtained during the system life cycle. OSWER requires that every project be approved at the end of each phase and stage of its life cycle to ensure that it will solve the information management problem, within an acceptable timeframe, and with reasonable resources. (The required approvals, and technique for determining the approval authority (i.e., Threshold Analysis), are described in the practice paper on 'System Life Cycle Reviews and Approvals'.) Specific information contained in this section includes:

- Identification of the applicable 'threshold', or organizational level for providing the required approvals. For a Level I system, also designates the criteria that result in the Level I classification;

- Identification of the specific approvals to be obtained in each phase and stage, and approximate schedule. The points of approval and approval schedule should be structured to reflect any adjustments to the system life cycle.

- Identification of the specific organizations and individuals who will participate in the approval process, and the means to be used to present system decision papers and other life cycle products (as appropriate) to the approval authority;

- Description of the approach/procedure to be used to document the results of each requested approval;

- Drawing from the project Workplan, identification of other approvals to be secured by the project, in addition to those identified in Part 2 of the OSWER System Life Cycle Management Guidance;

## 2.7. Benefit-Cost Analysis

This section provides a summary of the system benefit-cost analysis. This analysis is first presented in the Initiation Decision Paper as an initial rough estimate of project scale, and a comprehensive, detailed analysis is conducted during the Concept phase and is contained in the System Concept document. The Benefit-cost analysis presented in this section of the Project Management Plan draws on these life cycle products for both benefit and cost information. As the system evolves through the life cycle, this analysis must be updated. The current perspective of benefits and costs is documented in detail as a refinement to the System Concept (contained in the Initiation Baseline) and is documented in summary form in this section of the Project Management Plan. Specific information contained in this section includes:

- Analytic methodology and major assumptions regarding program direction, information management technology, resource availability, and/or other issues as applicable;
- System benefits:
  - Program effectiveness (quantified as specific measures of improvement if possible),
  - One time monetary benefits,
  - Recurring/annual monetary benefits;
- System costs:
  - Initial investment (e.g., Initiation phase through Implementation stage),
  - Recurring/annual costs,
  - Total system life cycle costs;
- System payback period; and
- Sensitivity of estimated benefits and costs to identified assumptions.

Of particular note, the costs documented in this section of the Project Management Plan, together with the Project Budget, serve as the cost information needed to conduct the Threshold Analysis for project reviews and approvals.

## 2.8. Methodologies and Tools

This section provides a summary of the methods and tools selected to conduct the activities of the system life cycle.

Each phase and stage of the life cycle should be conducted using an appropriate set of systems analysis and development methods tools. This section of the Project Management Plan identifies the methods and tools to be used, and also describes how the methods and tools will work together. It also describes how the tools will be used to produce the required documentation and other products of the life cycle, and any adjustments to the products (per the outlines contained in Part 2 of this Guidance).

This section draws from the System Concept the initial selections of methods and tools. These selections are confirmed during subsequent phases and stages, and any new or changed selections are documented in summary form in this section of the Project Management Plan. Examples of the types of methodologies and tools identified in this section of the Project Management Plan include:

- Techniques and software tools to support system requirements analysis (e.g., system prototyping),
- System analysis and design methodologies (e.g., Yourdon structured analysis, application generators),
- Techniques for data analysis (e.g., entity-relationship analysis),
- Computer-aided software engineering (CASE) tools,
- Programming languages (e.g., COBOL)
- Programming aids and debugging tools (e.g., OPTIMIZER III),
- Communications software (e.g., CICS, Kermit),
- Data base management software (e.g., ADABAS),
- File management and configuration management software tools (e.g., TIP Repository),
- Project management tools (e.g., TELLAPLAN, SUPERPROJECT) and;
- Word processing software (e.g., WORDPERFECT).

Specific information contained in this section for individual selections of methodologies and tools includes:

- Identification of methodology or tool,
- Training/other special support required, and
- Procurements needed for acquisition and/or support.

As illustrated in Exhibit 3-1, the selections for each phase and stage are finalized at the end of the immediately preceding phase/stage.

## 2.9. Workplan

This section describes in detail the logistics for conducting the project. It is structured to parallel the individual phases and stages of the system life cycle. The workplan describes the specific tasks for conducting the project, noting the relationships between tasks. For projects that are very large, complex, or on a very tight schedule, the workplan is particularly important -- it identifies the 'critical path' of activities that are instrumental to the success of the project. The workplan also identifies resources for each task, serving to clearly allocate the resources provided in the Project Budget.

The Workplan is most detailed for the immediately upcoming phases or stages and, as illustrated in Exhibit 3-1, is examined in detail and confirmed for each phase or stage prior to initiation of work in that phase or stage. The Workplan contains the following information for each phase/stage:

- Identification of all project activities, and work breakdown of activities into more discrete tasks as appropriate;
- Identification of all products, and mapping of activities/tasks to products;
- A schedule (i.e., start and completion dates for each activity/task) documented in the format of a Gantt chart, including the schedule for required formal reviews and approvals *;
- Agency staff and contractor assignments to each activity/task *;
- Level of resources/funding for each activity/task and/or life cycle product *;
- Schedule relationships/dependencies between activities and/or tasks, including dependencies with regard to activities/tasks for other phases or stages *; and
- For very large projects, where the system is divided into modules or work packages, it will be helpful to prepare a high level workplan integrating the project tasks across modules, and a more detailed workplan for each module. *
- For projects involving a procurement of hardware, software, or support services, one part of the Workplan

should be devoted to the activities of the "Procurement Approach" for the project.

For those items denoted above with an asterisk (*), it is suggested that automated project management tools be used to develop and document the corresponding portions of the project Workplan. The project Workplan also identifies the approach to be used for project status reporting, including procedures, report content, frequency, and assignments of personnel to perform status reporting.

2.10. Procurement Approach

This section summarizes the means to be used to acquire all contract support services, to acquire any needed hardware, software, and communications capabilities that are not currently installed at needed locations, and to obtain support from other government organizations (e.g., interagency agreements). Most projects include at least one significant resource acquisition, and the Procurement Approach helps ensure that the needed resources can be obtained and are available at the time they are needed.

The Procurement Approach should be complete for all stages through Production by the end of the Concept phase if possible, and no later than the end of the Definition stage, to ensure that adequate lead time is available to acquire needed resources. It is important to prepare this section of the Project Management Plan even if the project intends to acquire resources through an existing contract. Specific information contained in this section includes:

- o Resources to be acquired through existing OSWER contracts:
  - -- Resource identification (e.g., specific hardware, software, communications or service),
  - -- Contract identification,
  - -- Planned acquisition date, and
  - -- Lead contact person on project team;
- o Resources to be acquired through existing contracts of other Agency offices:
  - -- Resource identification
  - -- Contract identification,
  - -- Planned acquisition date, and
  - -- Lead contact person on project team;

- Resources to be acquired through new procurements:
  - -- Resource identification,
  - -- Planned procurement award date,
  - -- Scope of procurement anticipated (procurement for single project/system or a procurement to support multiple projects/systems),
  - -- Type of procurement (e.g., full and open competition, limited competition, sole source award),
  - -- Lead contact person on project team,
  - -- Lead contact person(s) at other Agency organization(s) providing procurement assistance, and
  - -- [Note that the workplan (tasks, milestones, schedules, staffing) for accomplishing all activities needed to complete the procurement is included in the "Workplan" section of the Project Management Plan;
- Support to be acquired from other EPA offices and government organizations (e.g., General Services Administration):
  - -- Organization identification,
  - -- Type of support needed,
  - -- Planned start date for support,
  - -- Lead contact person on project team, and
  - -- Lead contact person at support organization;
  - -- Tasks and task schedule for establishing needed agreement.

Some of the content of the Procurement Approach may be sensitive, and should be maintained and stored in a manner to prevent disclosure to contractors in advance of the proper time for formal notification of upcoming procurement actions.

## 2.11. Configuration Management Plan

This section describes the organization, procedures and tools used to identify, monitor and control the configuration of the system. Configuration Management is an important function within the OSWER system life cycle -- it serves to ensure the integrity of the system throughout its life cycle. The

Configuration Management Plan describes in detail how the project will conduct Configuration Management. Specific information contained in this section includes:

- Identification of Configuration Manager,
- Identification of Change Control Board -- organizations represented and individual members, and authority of the Board.
- System baselines (identification/index of configuration items),
- Change request review and approval procedures,
- Configuration status accounting procedures, and
- Software control procedures.

Some Configuration Management Plans may be quite long, and can be maintained as a stand-alone document that is referenced in the Project Management Plan.

A separate System Life Cycle Management Practice Paper entitled 'System Configuration Management' describes OSWER's practice of configuration management, and explains in more detail the content of the Configuration Management Plan.

## 2.12. Documentation Standards

This section identifies the standards to be used in producing the system documentation required in each phase and stage of the system life cycle. Standards are particularly important when contractor staff are preparing system documentation, because these standards are a key basis for determining whether the contractor has delivered adequate documentation.

This section includes the identification of specific OSWER standards, standards prescribed by the Agency, and standards adopted from other organizations, such as the Federal Information Processing Standards (FIPS) issued by the Bureau of Standards, Department of Commerce. In the absence of a mandatory standard for a system life cycle product, this section should identify a comparable product(s) produced by other projects that will serve as a model for the current project.

## 2.13. Security Approach

This section provides a summary of the security requirements and security features of the system. It is included in the Project Management Plan to provide an overview of security needed to prepare and review the Project Workplan and other sections of the Project Management Plan. This section draws from

the System Concept, Detailed Functional Requirements, Detailed Data Requirements, and System Design to provide a summary of the system and data security requirements and the system features that meet these requirements. Specific information presented in this section at a summary level includes:

- Functional security requirements,
- Data security requirements, including identification of confidential or sensitive information,
- Project team organization to develop and support specific security features and capabilities (if applicable),
- Hardware and facilities access security measures,
- Software and communications security measures,
- Data base security measures,
- Procedural measures (e.g., procedures for handling confidential or sensitive input documents and system outputs), and
- Software and data base backup and recovery measures.

## 2.14. Conversion Approach

This section draws from the System Concept, Detailed Functional Requirements, Detailed Data Requirements, and System Design to provide a summary of the data to be converted from existing systems and data bases, conversion activities and procedures, and organizations responsible for accomplishing the conversion. It is included in the Project Management Plan to provide an overview of the conversion approach needed to prepare and review the Project Workplan and other sections of the Project Management Plan. Specific information presented in this section at a summary level includes:

- Identification of major types of data to be converted, including conversion of data currently maintained in hardcopy form using manual procedures as well as the conversion of data currently maintained by automated systems;
- Identification of the following for each type of data to be converted:
  - -- Source and location of data,
  - -- Anticipated data quality problems,

-- Organization(s) responsible for data cleanup,

-- Organization(s) responsible for planning and conversion,

-- Conversion schedule, and

-- Reference to specific sections of system documentation describing detailed conversion procedures and software.

## 2.15. Installation Approach

This section draws from the System Concept and System Design to provide a summary of the logistics for installing the system and data base in the production environment. It is included in the Project Management Plan to provide an overview of the installation approach needed to prepare and review the Project Workplan and other sections of the Project Management Plan. Specific information presented in this section at a summary level includes:

- o Identification of the major modules/components that will be separately installed items;
- o Identification of the facilities and location(s) at which the system and data base will be installed, and the specific modules/components to be installed at each location;
- o Identification for each module/component installed at each location:
  - -- Installation date,
  - -- Special conditions (if any),
  - -- Organizations and specific personnel to perform the installation, and
  - -- Organizations and specific personnel on call to support the installation;
- o Mechanisms to ensure effective software integration and data bases synchronization for system modules/components installed at multiple locations.

## 2.16. User Support Approach

This section draws from the System Concept, Detailed Functional Requirements, and System Design to provide a summary of the activities and materials to be used to conduct initial system training and provide ongoing user support. It is included in the Project Management Plan to provide an overview of the user support approach needed to prepare and review the Project Workplan and other sections of the Project Management Plan.

Specific information presented in this section at a summary level includes:

- Lead organizations for planning and conducting training and ongoing user support;
- Identification of individual training sessions to be conducted in support of initial system implementation, and for each session:
  - -- Location, date and time,
  - -- Intended trainees and subject material (e.g., data entry/edit/update procedures, reporting and retrieval, system administration, etc.),
  - -- Session format (group presentation/demonstration, one-on-one training), and
  - -- Organizations and individuals who will conduct training;
- Identification of other training activities/materials, such as tutorials, computer-based training, etc.
- Identification of user support functions such as hotlines, user groups, etc., including for each function:
  - -- Function identification,
  - -- Expected duration,
  - -- Staffing level,
  - -- Assignments of specific organizations and individuals, and
  - -- Physical location(s).

## 2.17. Maintenance Approach

This section draws from the System Concept, Detailed Functional Requirements, and System Design to provide a summary of the organizational approach for maintaining the system. System maintenance is crucial to the ongoing viability of the system. For distributed systems, system maintenance is particularly challenging, and the Maintenance Approach takes on added importance. This section is included in the Project Management Plan to provide an overview of the Maintenance Approach needed to prepare and review the Project Workplan and other sections of the Project Management Plan. Specific information presented in this section includes:

- Identification of organizations responsible for performing software maintenance for each system module;

- Identification of organizations responsible for maintaining applications software packages, including any customized portions of the package;

- Identification of organizations responsible for maintaining each interface with other automated systems and data bases;
- Identification of organizations responsible for supporting the release of new software (routine maintenance and enhancements) at each location where the system is installed; and

- Identification of currently planned maintenance and system enhancement releases, and the content and installation schedule for each release.

Other documents provide additional, detailed information regarding system maintenance: details of software libraries and maintenance procedures are documented in the Maintenance Manual, and are summarized in the Configuration Management Plan (another section of the Project Management Plan). These documents should be specifically referenced by the Maintenance Plan.

2.18. Operations Approach

This section draws from the System Concept, Detailed Functional Requirements, and System Design to provide a summary of the organizational approach for operating the system. It is included in the Project Management Plan to help ensure that all organizations with system operations responsibilities are clearly designated and are informed of their responsibilities. Specific information presented in this section includes:

- Identification of organizations responsible for performing basic system operations -- data entry, update, and reporting -- for each module of the system;

- Identification of organizations responsible for performing system and data base backup and recovery for each facility (including individual microcomputers) where the system is installed;

- Identification of organizations responsible for performing other system administration functions (e.g., maintenance of data tables) for each facility where the system is installed; and

- Reference to the Data Management Plan for the system to identify organizations responsible for other data administration functions.

Other documents provide additional, detailed information regarding system operations: details of operating procedures are

documented in the Operation Manual and User Manual. Organizations responsible for providing technical support to users are identified in the User Support Plan (another section of the Project Management Plan). These documents should be specifically referenced by the Operations Plan.

## 3. DEVELOPMENT AND UPDATE OF THE PROJECT MANAGEMENT PLAN

### 3.1. Responsibility for Developing and Updating the Project Management Plan

The Project Manager is responsible for developing the Project Management Plan and for keeping it current throughout the system life cycle. An out of date Project Management Plan is not useful to guide the project, and could lead to confusion among project participants. The Project Manager may be assisted by other individuals as appropriate.

### 3.2. Format of the Project Management Plan

All sections of the Project Management Plan should be kept in a single document, organized in accordance with the major topics of the Plan. Use of a three-ring binder or binders is recommended. For those portions of the Project Management Plan developed and maintained using automated project management tools, current outputs of the tools should be included in the binder, if possible. Certain sensitive sections of the Plan that should not be readily available to all team members, such as the details of the procurement approach, may be maintained in a separate binder.

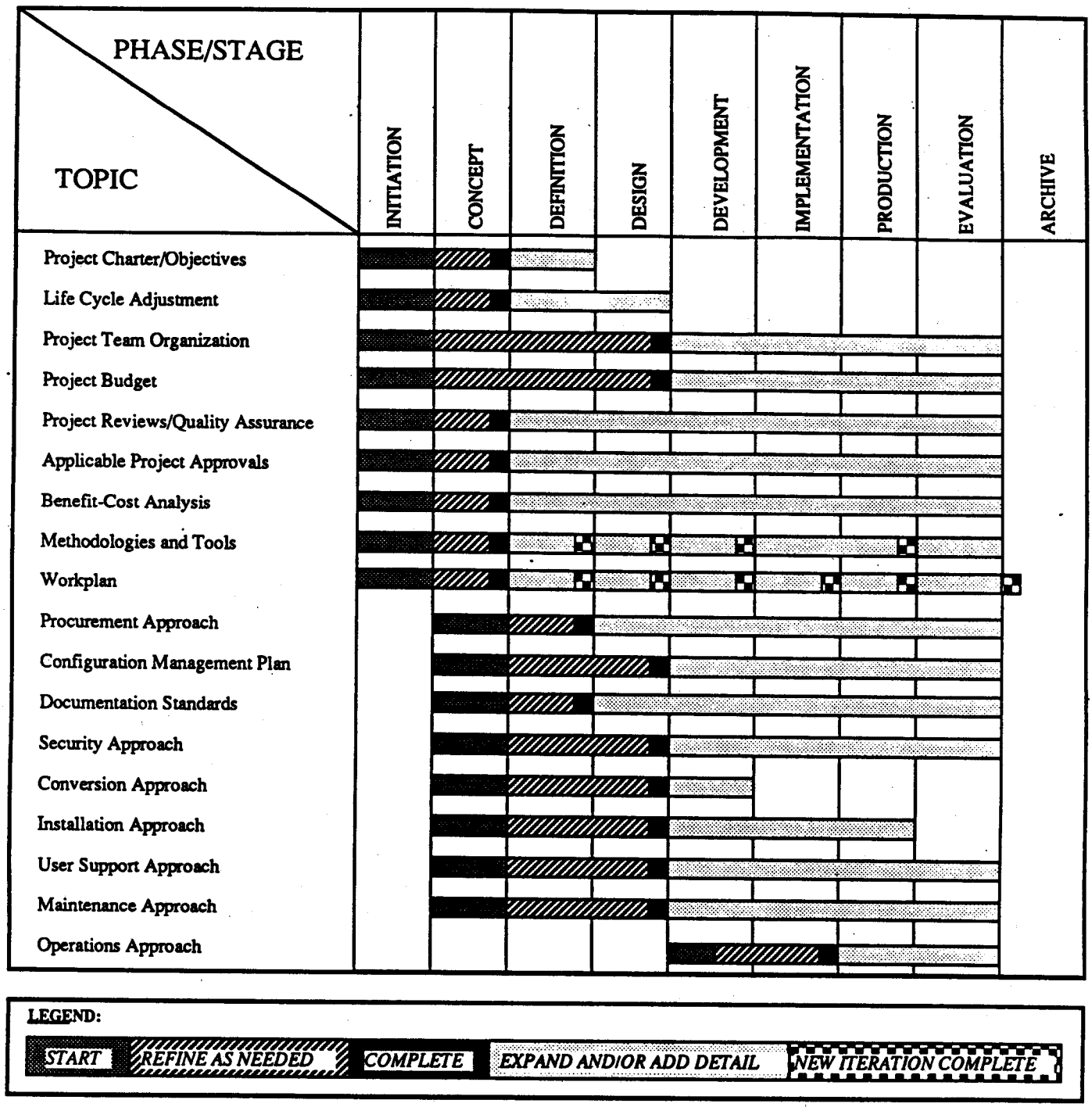
### 3.3. Evolution of the Project Management Plan Through the System Life Cycle

The Project Management Plan evolves over the course of the system life cycle, including a subset of topics at the end of the Initiation phase, and evolving into a comprehensive plan by the end of the Concept phase. Exhibit 3-1 illustrates the evolution of the Project Management Plan through the system life cycle.

At the end of the Initiation phase, the plan should contain information about several topics, as shown in Exhibit 3-1. At this time, only limited information is known about the information management problem or the potential solutions. Thus, the Project Management Plan contains some basic information about the project, and a workplan for the Concept phase. Specific topics addressed in this first draft of the Project Management Plan are:

- Project Charter/Objectives - Includes identification of the information management problem to be solved, the pertinent programmatic mission, and a preliminary view

# EXHIBIT 3-1: EVOLUTION OF PROJECT MANAGEMENT PLAN THROUGH THE SYSTEM LIFE CYCLE



of the scope of the problem in terms of the functions and organizations experiencing the problem. This section also identifies the project sponsor.

- Life Cycle Adjustment - Includes any adjustments to the life cycle to be made in the Concept phase. For example, for a relatively simple problem, the more detailed functional and data requirements normally performed during the Definition stage might be included in the Concept phase.

- Project Team Organization - Includes identification of the Project Manager, and the project participants and project team structure for the Concept phase. This section identifies participating organizations and individuals for the Concept phase, and also identifies the intended use of contractor support.

- Project Budget - Identifies the total resources needed to conduct the Concept phase, and includes a preliminary order of magnitude preliminary estimate of the aggregate cost of all other stages through the Implementation stage (e.g., whether the aggregate cost should be viewed in terms of thousands, hundreds of thousands, or millions of dollars, and commensurate EPA workyears).

- Project Reviews/Quality Assurance - Identifies the preliminary threshold level for the project based on the known information about the problem. (How the 'threshold analysis' should be conducted is described in the practice paper for 'System Life Cycle Reviews and Approvals'.) Also identifies the lead reviewer for the project and a scheduled dates for completion of the Initiation phase and Concept phase reviews.

- Applicable Project Approvals - Based on the preliminary threshold level for the project and known information about the problem, identifies the approval authority (in terms of specific organization(s) and individual(s)) for the Initiation and Concept phases of the project.

- Benefit-Cost Analysis - Provides only a rough order of magnitude estimate of the project costs (based on the budget estimates described above) and a brief narrative statement of the expected benefits and the organizations that will realize them. A quantitative estimate of benefits is not essential in the Initiation phase.

- Methodologies and Tools - Identifies the analytic methods and automated tools that will be used in the Concept phase.

- Workplan - Describes the tasks to be conducted in the Concept stage, noting for each task who will perform the

task, its schedule, resources to be used, and products to be generated. The Workplan should include a summary prepared in a Gantt chart format whenever possible. The Workplan also identifies at this time any key assumptions or constraints on conducting the tasks of the Concept stage.

The Concept phase adds considerable new information to the Project Management Plan, introducing most of the remaining topics and adding detail to the topics first addressed during the Initiation phase. By the end of this phase, the Project Management Plan is comprehensive. The Concept phase results in the selection of a specific alternative for solving the information management problem, and the Project Management Plan describes the management approach for taking that alternative through the remainder of the system life cycle.

In succeeding phases and stages, the Project Management Plan is updated and refined as necessary, based on the results of project activities. Some sections of the Project Management Plan may change significantly to address difficulties encountered in managing the project. Any changes to the basic system concept will likely result in changes to one or more elements of the Project Management Plan, with the Workplan and Project Budget the most likely to change. If at any time it becomes necessary to significantly change any part of the Project Management Plan, the Project Manager should retain the prior version for reference purposes and to support the post-implementation evaluation of the system.

### 3.4 Retention of Old Project Management Plans

The Project Management Plan is a living document, evolving continuously throughout the system life cycle. Although keeping the Project Management Plan current is important, it is also important to preserve prior versions of the plan to preserve a record of the evolution of the project. This record will be very useful if there is a changeover in project management -- it will enable the new Project Manager to more easily 'come up to speed' on both the current status of the project and its history. In addition, this record will be extremely useful if the project is audited by the Agency's Office of the Inspector General (OIG). It will enable the project team, and the project sponsor, to provide the information requested by the OIG much more easily and ensure that the information provided is accurate.

Although the Project Management Plan may be refined relatively frequently, the Guidance does not require the same extent of recordkeeping as for other system documents, those contained in system baselines. To ensure that a complete record of the Project Management Plan history is retained, a copy of the current Project Management Plan should be filed with each approved System Decision Paper, in the same baseline as the corresponding System Decision Paper. For most projects, this

procedure will result in filing a copy of the Project Management Plan at the end of each phase and stage of the system life cycle.

## 4. RELATIONSHIPS BETWEEN PROJECT MANAGEMENT PLAN TOPICS

The topics of the Project Management Plan are related to each other in that they address different perspectives of the same project management issues. It is therefore important that the contents of the Project Management Plan be internally consistent. For example, the cost of contractor resources to conduct the activities enumerated in the project Workplan must be consistent with available contract funding identified in the Project Budget. Similarly, the intended use of contractor support must be reflected in the Procurement Approach to ensure that the means for acquiring such support (e.g., signed contracts) are in place in a timely manner. Exhibit 4-1 identifies all significant relationships among the topics of the Project Management Plan. Exhibit 4-2 describes each of these relationships.

# EXHIBIT 4-1: SUMMARY OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT PLAN TOPICS

| TOPIC \ RELATED TOPIC | Project Charter/Objectives | Life Cycle Adjustment | Project Team Organization | Project Budget | Project Reviews/Quality Assurance | Applicable Project Approvals | Benefit-Cost Analysis | Methodologies and Tools | Workplan | Procurement Approach | Configuration Management Plan | Documentation Standards | Security Approach | Conversion Approach | Installation Approach | User Support Approach | Maintenance Approach | Operations Approach |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Charter/Objectives | | | ● | | ● | ● | | | | | | | | | | | | |
| Life Cycle Adjustment | | | ● | ● | ● | ● | | ● | ● | ● | ● | | | ● | ● | | | |
| Project Team Organization | | | | | ● | ● | | | ● | ● | ● | | | ● | ● | ● | ● | ● |
| Project Budget | | | | | | | ● | | ● | ● | | | | | | | | |
| Project Reviews/Quality Assurance | | | | | | ● | ● | | ● | | ● | | | | | | | |
| Applicable Project Approvals | | | | | | | ● | | ● | | | | | | | | | |
| Benefit-Cost Analysis | | | | | | | | | | | | | | | | | | |
| Methodologies and Tools | | | | | | | | | ● | ● | ● | ● | ● | ● | ● | | ● | |
| Workplan | | | | | | | | | | ● | ● | | ● | ● | ● | ● | ● | ● |
| Procurement Approach | | | | | | | | | | | | | ● | ● | ● | ● | ● | ● |
| Configuration Management Plan | | | | | | | | | | | | | | | | | ● | ● |
| Documentation Standards | | | | | | | | | | | | | | | | | | |
| Security Approach | | | | | | | | | | | | | | | | | | |
| Conversion Approach | | | | | | | | | | | | | | | ● | | | |
| Installation Approach | | | | | | | | | | | | | | | | | | |
| User Support Approach | | | | | | | | | | | | | | | | | | |
| Maintenance Approach | | | | | | | | | | | | | | | | | | |
| Operations Approach | | | | | | | | | | | | | | | | | | |

● Designates two topics that address one or more common subjects, and that should treat these subjects in a consistent manner. For example, the use of contractors as shown in a Project Workplan should be reflected as well in the Procurement Plan.

## EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS

| Topic | Related Topic | Relationship |
|---|---|---|
| Project Charter/ Objectives | Project Team Organization | The lead organization for the project is designated in the Project Charter. |
| | Project Reviews/ Quality Assurance | The Project Charter designates the threshhold level for the system, and one or more of the organizations that should participate in project reviews. |
| | Applicable Project Approvals | The Project Charter designates the threshhold level for the system, and one or more of the organizations that should participate in project reviews. |
| Life Cycle Adjustments | Project Team Organization | The project team structure and/or participants may change during the life cycle, and should reflect any life cycle adjustments. For large systems, adjustments to the life cycle that provide a phased development and implementation of major modules or work packages should be reflected in the project team organization. |
| | Project Budget | The project budget, which is usually presented to follow the standard phases and stages, should be structured to reflect any adjustments to the life cycle. |
| | Project Reviews/ Quality Assurance | Life cycle adjustments which serve to combine parts of phases and stages may affect the number and/or timing or project reviews. The specific reviews to be conducted should reflect any such adjustments. |

**EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS**

| Topic | Related Topic | Relationship |
|---|---|---|
| Life Cycle Adjustments (continued) | Applicable Project Approvals | Life cycle adjustments which serve to combine parts of phases and stages may affect the number and/or timing or project approvals. The specific approvals to be conducted should reflect any such adjustments. |
| | Methodologies and Tools | The identification of specific methodologies and tools should be consistent with any adjustments to the life cycle. Also, some tools, such as program code generators, by themselves define an adjustment to the life cycle in that activities conducted in one stage (e.g., Design) may generate automatically products that are typically produced in another stage (e.g., Development). |
| | Workplan | The project Workplan must be consistent with any adjustments to the phases and stages of the life cycle. Each task/activity should be associated with a specific phase or stage. |
| | Procurement Approach | The Procurement Approach identifies the resources to be acquired for each phase and stage, and should be consistent with any life cycle adjustments. |
| | Configuration Management Plan | Adjustments to the life cycle should be reflected in the products associated with each baseline. The content of some baselines may differ from the typical set products. |
| | Conversion Approach | Life cycle adjustments, particularly those that provide a phased development of modules or work packages, may require a comparable phasing of data conversion activities for each module. |

## EXHIBIT 4-2: DET. _ OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS

| Topic | Related Topic | Relationship |
|---|---|---|
| Life Cycle Adjustments (continued) | Installation Approach | Life cycle adjustments, particularly those that provide a phased development of modules or work packages, may require a comparable phasing of installation activities for each module. |
| Project Team Organization | Project Reviews/ Quality Assurance | The Project Team Organization should identify the organizations, and individuals from each organization, that will perform formal project reviews and other quality assurance activities. The designated organizations should be consistent with the results of the 'threshold analysis' determining the appropriate level of project review and approval. |
| | Applicable Project Approvals | The Project Team Organization should identify the organizations, and individuals from each organization, that will provide required project approvals. The designated organizations should be consistent with the results of the 'threshold analysis' determining the appropriate level of project review and approval. |
| | Workplan | The assignment of specific tasks presented in the project Workplan should reflect the specific organizations and individuals identified in the Project Team Organization. |
| | Procurement Approach | The use of contractors to conduct the project is identified in the Project Team Organization. Each contract vehicle under which contractor support is to be obtained, including new procurements, should be identified in the Procurement Approach |

**EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS**

| Topic | Related Topic | Relationship |
|---|---|---|
| Project Team Organization | Configuration Management Plan | The Project Team Organization should identify specific organizations and individuals who will perform specific configuration management functions identified in the Configuration Management Plan: Configuration Manager, and Change Control Panel. |
| | Conversion Approach | The Project Team Organization should reflect the content of the Conversion Approach regarding the specific organizations responsible for determining the data to be converted to the new system/data base, and for accomplishing the data conversion. |
| | Installation Approach | The Project Team Organization should reflect the content of the Installation Approach regarding the specific organizations responsible for supporting system installation, including installations at all locations for distributed systems. |
| | User Support Approach | The Project Team Organization should reflect the content of the User Support Approach regarding the specific organizations responsible for providing initial system training and performing ongoing user support activities. |
| | Maintenance Approach | The Project Team Organization should reflect the content of the Maintenance Approach regarding the specific organizations responsible for performing maintenance activities, including maintenance of interfaces with other systems and data bases. |

## EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS

| Topic | Related Topic | Relationship |
|---|---|---|
| Project Team Organization | Operations Approach | The Project Team Organization should reflect the content of the Operations Approach regarding the specific organizations responsible for operations support, including support of operations at each location for distributed systems. |
| Project Budget | Benefit-Cost Analysis | The costs documented in the Project Budget should be consistent with the costs identified in the Benefit-Cost Analysis. |
| | Workplan | The resources identified by task in the Workplan should be, in the aggregate, consistent with the resources provided in the Project Budget for each type of resource. |
| | Procurement Approach | All contract resources identified in the Project Budget should also be reflected in the Procurement Approach |
| Project Reviews/ Quality Assurance | Applicable Project Approvals | The level of organization(s) responsible for conducting project reviews should be consistent with the results of the threshold analysis for determining the appropriate level of project approvals. |
| | Benefit-Cost Analysis | Benefit-Cost Analyses that show project costs (one time investment, annual costs, and/or total life cycle) greater than OMB and/or OIRM reporting requirements require formal project reviews conducted by the SIRMO and appropriate Information Management Coordinators. |
| | Workplan | Individual project reviews and other quality assurance activities should be specifically identified and scheduled in the project Workplan. |

## EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS

| Topic | Related Topic | Relationship |
|---|---|---|
| Project Reviews/ Quality Assurance (continued) | Configuration Management Plan | Specific organizations and individuals who will participate in reviews of requested changes to the system are designated as the Change Control Panel and are identified under both topics. |
| Applicable Project Approvals | Benefit-Cost Analysis | Benefit-Cost Analyses that show project costs (one time investment, annual costs, and/or total life cycle) greater than OMB and/or OIRM reporting requirements require project approvals by the Information Management Steering Committee. |
| | Workplan | Individual project approvals should be specifically identified and scheduled in the project Workplan. |
| Methodologies and Tools | Workplan | Tasks for selecting project methodologies and tools should be specifically identified and scheduled in the project Workplan. |
| | Procurement Approach | The acquisition of automated tools not currently owned or leased by the Agency should be included in the Procurement Approach |
| | Configuration Management Plan | The identification of automated tools, if any, to support configuration management activities should be consistent under both of these topics. |
| | Documentation Standards | The selection of methodologies and tools should be consistent with, and support, the selected documentation standards. |
| | Security Approach | The identification of automated tools, if any, to design, implement or assess system and data base security should be consistent under both of these topics. |

## EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS

| Topic | Related Topic | Relationship |
|---|---|---|
| Methodologies and Tools (continued) | Conversion Approach | The identification of automated tools, if any, to support data conversion should be consistent under both of these topics. |
| | Installation Approach | The identification of automated tools, if any, to support system installation should be consistent under both of these topics. |
| | Maintenance Approach | The identification of automated tools, if any, to support software maintenance should be consistent under both of these topics. |
| Workplan | Procurement Approach | Activities for accomplishing the acquisitions identified in the Procurement Approach should be specifically included and scheduled in the project Workplan. |
| | Configuration Management Plan | Activities supporting the development of the Configuration Management Plan, and its implementation, should be specifically included and scheduled in the project Workplan. Scheduling of meetings of the Change Control Panel should be included in the Workplan. |
| | Security Approach | Activities supporting the development of the Security Approach and its implementation, should be specifically included and scheduled in the project Workplan. |
| | Conversion Approach | Activities supporting the development of the Conversion Approach should be specifically included and scheduled in the project Workplan. Activities for accomplishing the conversion of data into the new system or data base also should be included and scheduled in the Workplan. |

## EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS

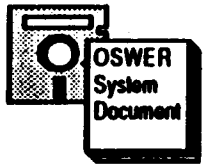
| Topic | Related Topic | Relationship |
|---|---|---|
| Workplan (continued) | Installation Approach | Activities supporting the development of the Installation Approach, and its implementation, should be specifically included and scheduled in the project Workplan. |
| | User Support Approach | Activities supporting the development of the User Support Approach, and its implementation, should be specifically included and scheduled in the project Workplan. |
| | Maintenance Approach | Activities supporting the development of the Maintenance Approach, and its implementation, should be specifically included and scheduled in the project Workplan. |
| | Operation Approach | Activities supporting the development of the Operation Approach, and its implementation, should be specifically included and scheduled in the project Workplan. |
| Procurement Approach | Security Approach | The acquisition of hardware and/or software not currently owned or leased by the Agency to provide system or data base security should be included in the Procurement Approach. |
| | Conversion Approach | The acquisition of hardware and/or software not currently owned or leased by the Agency to support data conversion, or the use of contractor support to accomplish data conversion, should be included in the Procurement Approach. |
| | Installation Approach | The acquisition of hardware and/or software not currently owned or leased by the Agency to support system installation, or the use of contractor support to install the system, should be included in the Procurement Approach. |

## EXHIBIT 4-2: DETAILS OF RELATIONSHIPS BETWEEN PROJECT MANAGEMENT TOPICS

| Topic | Related Topic | Relationship |
|---|---|---|
| Procurement Approach (continued) | User Support Approach | The acquisition of hardware and/or software not currently owned or leased by the Agency to conduct training and other user support activities, or the use of contractors to provide user support, should be included in the Procurement Approach. |
| | Maintenance Approach | The acquisition of hardware and/or software not currently owned or leased by the Agency to perform system maintenance, or the use of contractors to maintain the system, should be included in the Procurement Approach. |
| | Operation Approach | The use of contractors to operate the system should be included in the Procurement Approach. |
| Configuration Management Plan | Maintenance Approach | Procedures for assessing requested changes to the system, including maintenance changes, and for tracking the status of change requests, are included in the Configuration Management Plan. The organizations responsible for maintaining the system should be represented on the Change Control Panel designated in the Configuration Management Plan. |
| | Operations Approach | Procedures used to record anomalies of system operations, and to track their resolution, are identified in the Configuration Management Plan. |
| Conversion Approach | Installation Approach | Installation of the system should generally provide for the loading of existing data prior to cutover to full production. The Installation Approach should refer to the Conversion Approach for the details of accomplishing data conversion activities. |

# APPENDIX A

## DETAILED OUTLINE OF PROJECT MANAGEMENT PLAN



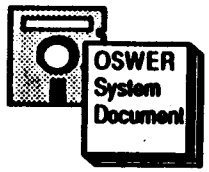

# PROJECT MANAGEMENT PLAN

**SUMMARY DESCRIPTION**

The Project Management Plan is created during the Initiation phase and updated in each phase or stage of the system life cycle. Some topics (e.g., security approach, maintenance approach) are summarized in the Project Management Plan, and presented in greater detail in other life cycle products.

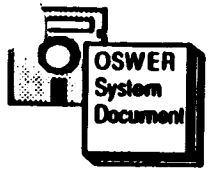
**TOPICS**

- o Project charter/objectives
  - -- Project identification (incorporate Initiation Decision Paper by reference)
  - -- Mission and objectives
  - -- Scope of information management problem/project
- o Life cycle adjustment
  - -- Consolidation of phases and stages, if any
  - -- Partitioning of project/system into major work packages, modules, etc. with different timing through the life cycle
- o Project team organization
  - -- Project management structure
    - Manager assigned: individual, current organization, authority
    - Boards, committees, or other project management participants
    - Changes or additions for Operation phase
  - -- Project team organization
    - Structure and roles
    - Participating organizations
    - Staffing plan (including internal staff and use of contractors)
    - Changes or additions for Operation phase
  - -- Other organizations to be notified of major project events (non-participants in project team)




# PROJECT MANAGEMENT PLAN (Continued)

- Project budget (broken out by stage)
  - -- EPA staff
  - -- Contractor services
  - -- Equipment acquisition
  - -- Hardware maintenance
  - -- Site preparation
  - -- Packaged software acquisition
  - -- Supplies
  - -- Timeshare
  - -- Other
  - -- Cost-accounting methodology
- Project reviews/quality assurance
  - -- Applicable project review level
  - -- Reviews to be conducted (by stage)
  - -- Organization/individuals for each review
  - -- Review schedule
- Applicable project approvals
  - -- Project approval level
  - -- Specific approvals to be obtained (by stage)
  - -- Approval organization and individuals
  - -- Approval schedule
- Benefit-cost analysis (summary, transferred from other life cycle products)
  - -- Methodology and assumptions
  - -- Benefits
    - Programmatic
    - Annual monetary
    - System life
  - -- Costs
    - Nonrecurring
    - Recurring
    - Annual
    - System life
  - -- Payback period
  - -- Sensitivity analysis
- Methodologies and tools
  - -- Methodologies (non-automated)
    - For Concept phase
    - For Definition stage
    - For Design stage
    - For Development stage
    - For Implementation stage
    - For Production stage
    - For Evaluation stage
    - For Archive stage




# PROJECT MANAGEMENT PLAN (Continued)

-- Automated tools/software packages

- For Concept phase
- For Definition stage
- For Development stage
- For Implementation stage
- For Production stage
- For Evaluation stage
- For Archive stage
- Support required (if any) for use of tools

o Workplan

-- Concept Phase
-- Definition Stage
-- Development stage
-- Implementation stage
-- Production stage
-- Evaluation stage
-- Archive stage
- Activities and related tasks
- Products
- Schedule by task and product
- Staff and contractor assignments
- Level of resources for each task and/or product
- Task relationships/dependencies
- Schedule of reviews and approval
- Performance/progress reporting
- Notification

o Procurement approach

-- Resources to be acquired through existing contracts

- OSWER contracts
- Other agency contracts

-- Resources to be acquired through new procurements

- OSWER vehicles
- Other Agency vehicles
- Schedule for each procurement
- Workplan for each OSWER procurement
- Procurement assistance individuals for each procurement

o Configuration Management Plan

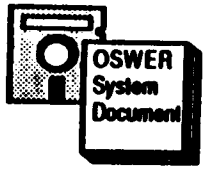
-- Configuration manager (organization and individual)

-- Change Control Board

- Participants (organizations and individuals)
- Modification request/approval process

-- Procedures/methods for configuration identification and accounting, software control, audits

-- Configuration management documentation: identification and location of existing CM logs, and official existing baseline contents




# PROJECT MANAGEMENT PLAN (Continued)

- o Documentation standards: Standards to be used for each life cycle product

- o Security approach
  - -- Summary of security requirements (reference other life cycle products)
  - -- Security organization (if applicable)
  - -- Hardware and facilities measures
  - -- Software and communications measures
  - -- Data base security
  - -- Procedural measures

- o Conversion approach
  - -- Overview
    - Data identification
    - Current data location
    - Organizations to accomplish conversion
  - -- Manual data to be converted
    - Sources
    - Procedures
    - Error conditions to be corrected
  - -- Automated data to be converted
    - Sources
    - Procedures
    - Error conditions to be corrected

- o Installation approach: Schedule for installing each separately-installed system module
  - -- Dates and times, by module and location
  - -- Special conditions
  - -- Personnel to accomplish installation, and/or on call

- o User support approach
  - -- Training activities
    - Materials to be prepared
    - Sessions, schedules, and participants
  - -- Ongoing user support (hotline, etc.)

- o Maintenance approach
  - -- Maintenance support organization
  - -- Release management procedures
  - -- Planned maintenance releases

- o Operation approach
  - -- Organization of operation support activities
  - -- Reference to Operation Manual